

WHAT IS CLAIMED IS:

1. A method of manufacturing a thin film magnetic head including two magnetic layers magnetically coupled to each other having two magnetic poles which face each other with a gap layer in between and are to be faced with a recording medium, a thin film coil provided between the two magnetic layers, and an insulating layer for insulating the thin film coil from the two magnetic layers;

formation of one of the two magnetic layers is performed by the steps of:

forming a first magnetic layer portion extending from recording-medium-facing surface in a longitudinal direction to be away from the recording-medium-facing surface, and having a constant width for defining a write track width of a recording medium; and

forming a second magnetic layer portion magnetically coupled to the first magnetic layer portion in the rear edge of the first magnetic layer portion on the side away from the recording- medium -facing surface;

wherein a coupling position at which the first and second magnetic layer portion are coupled each other is closer to the recording-medium-facing surface than a front edge of the insulating layer on the side close to the recording-medium-facing-surface; and

at least the portion of the second magnetic layer portion between the front edge of the insulating layer and the rear edge of the first magnetic layer portion has a width wider than that of the first magnetic layer portion.

2. A method of manufacturing a thin film magnetic head according to claim 1, wherein a step in a width direction is formed at the coupling position of the first magnetic layer portion and the second magnetic layer portion.

3. A method of manufacturing a thin film magnetic head according to claim 2, wherein a step face vertical to an extending direction of the first magnetic layer portion is formed at the coupling position.

4. A method of manufacturing a thin film magnetic head according to claim 1, further comprising a magnetic transducer film extending from the recording-medium-facing surface in a longitudinal direction to be away from the recording-medium-facing surface wherein:

the coupling position is located between the rear edge of the magnetic transducer film and the front edge of the insulating layer.

5. A method of manufacturing a thin film magnetic head according to claim 4, wherein the length from the recording- medium -facing surface to the front edge of the insulating layer lies within the range of one-and-a-half to six times the length of the magnetic transducer film.

6. A method of manufacturing a thin film magnetic head according to claim 1, wherein the one of the two magnetic layers further includes a third magnetic layer portion which is magnetically coupled to the second magnetic layer portion and extends to cover a part of the thin film coil with the insulating layer in between.

7. A method of manufacturing a thin film magnetic head according to claim 1, wherein:

the gap layer has a region with a flat surface;

the thin film coil is formed on the flat region of the gap layer; and

the insulating layer includes an insulating film which covers the whole of the thin film coil and a part of the gap layer.

8. A method of manufacturing a thin film magnetic head according to claim 7 wherein the position of the front edge of the insulating layer is defined by

an edge of the insulating film on the side closer to the recording- medium -facing surface.

9           A method of manufacturing a thin film magnetic head according to claim 8 wherein the first magnetic layer portion is located on a part of the region with a flat surface of the gap layer, the part of the region being not covered with the insulating film.

10.       A method of manufacturing a thin film magnetic head according to claim 9 wherein:

            the surface of the insulating film on the side closer to the recording-medium-facing surface forms a slope towards the surface of the gap layer; and

            the second magnetic layer portion extends from the coupling position onto the slope of the insulating film.

11.       A method of manufacturing a thin film magnetic head according to claim 10 wherein:

            the second magnetic layer portion terminates on the slope of the insulating film and the insulating layer includes another insulating film formed to fill a space over the insulating film up to the same level as a top surface of the second magnetic layer portion.

12.       A method of manufacturing a thin film magnetic head according to claim 1, wherein:

            the other magnetic layer of the two magnetic layers includes a fourth magnetic layer portion with a flat surface, and a fifth magnetic layer portion located facing the first and second magnetic layer portions with the gap layer in between and magnetically coupled to the fourth magnetic layer portion and;

            the thin film coil is buried between the fourth magnetic layer portion and the gap layer with a part of the insulating layer in between.

13. A method of manufacturing a thin film magnetic head according to claim 12, wherein the position of the front edge of the insulating layer is defined by the rear edge of the fifth magnetic layer portion, the rear edge being on the side closer to the recording- medium -facing surface.

14. A method of manufacturing a thin film magnetic head according to claim 12, wherein:

the gap layer has a region with a flat surface;

the insulating layer includes an insulating film formed on the opposite side of the thin film coil with the gap layer in between; and

the first magnetic layer portion is located on a part of the region with a flat surface of the gap layer, the part of the region being not covered with the insulating film.

15. A method of manufacturing a thin film magnetic head according to claim 14, wherein:

the surface of the insulating film closer to the recording-medium-facing surface forms a slope towards the surface of the gap layer; and

the second magnetic layer portion extends from the coupling position onto the slope of the insulating film.

16. A method of manufacturing a thin film magnetic head according to claim 1, wherein the first and second magnetic layer portions are integrally formed in one piece through a series of the manufacturing steps.

17. A method of manufacturing a thin film magnetic head according to claim 6, wherein the first, second and third magnetic layer portions are integrally formed in one piece through a series of the manufacturing steps.

18. A method of manufacturing a thin film magnetic head according to claim 6, wherein the first and second magnetic layer portions are integrally formed in one piece through a series of the manufacturing steps; and

the third magnetic layer portion is formed separately from the first and second magnetic layer portions through a manufacturing step different from the steps of manufacturing the first and second magnetic layer portions.

19. A method of manufacturing a thin film magnetic head according to claim 18, wherein the third magnetic layer is formed so that the third magnetic layer extends overlapping at least a part of the second magnetic layer portion.

20. A method of manufacturing a thin film magnetic head including two magnetic layers magnetically coupled to each other having two magnetic poles which face each other with a gap layer in between and are to be faced with a recording medium, a thin film coil provided between the two magnetic layers, and an insulating layer for insulating the thin film coil from the two magnetic layers; wherein one of the two magnetic layers includes:

a first magnetic layer portion extending from recording-medium-facing surface in a longitudinal direction to be away from the recording-medium-facing surface, and having a constant width for defining a write track width of a recording medium; and

a second magnetic layer portion magnetically coupled to the first magnetic layer portion in the rear edge of the first magnetic layer portion on the side away from the recording- medium -facing surface;

the method comprising:

a step of forming an insulating film on the gap layer with a flat surface, the insulating film having a slope towards the surface of the gap layer and constituting at least a part of the insulating layer;

a step of forming a photoresist layer so as to cover the gap layer and the insulating film;

a first exposure step of selectively exposing a first region of the photoresist layer including a region corresponding to the first magnetic layer portion, the first region corresponding to a flat region of the gap layer; and

a second exposure step of selectively exposing at least a second region of the photoresist layer corresponding to the second magnetic layer portion, the second region corresponding to a region from the slope of the insulating film to the flat region of the gap layer:

wherein the first region and the second region partially overlap each other.

21. A method of manufacturing a thin film magnetic head according to claim 20, wherein the second magnetic layer portion is formed so that:

a coupling position at which the first magnetic layer portion and the second magnetic layer portion are coupled each other is closer to the recording-medium -facing surface than the front edge of the insulating layer on the side close to the recording-medium-facing-surface; and

at least the portion of the second magnetic layer portion between the front edge of the insulating layer and the rear edge of the first magnetic layer portion has a width wider than that of the first magnetic layer portion.

22. A method of manufacturing a thin film magnetic head according to claim 20 wherein the first region has a substantially constant width at any point in a longitudinal direction.

23. A method of manufacturing a thin film magnetic head according to claim 20 wherein the first region includes:

a constant-width part having a constant width, which extends from the recording- medium -facing surface in a longitudinal direction to be away from the recording-medium-facing surface and defines the write track width of the recording medium; and

a wide-width part with a width wider than the constant-width part, at least a part of the wide-width part overlapping the second region.

24. A method of manufacturing a thin film magnetic head according to claim 20, wherein the one of the magnetic layer further includes a third magnetic layer which is magnetically coupled to the second magnetic layer portion and extends to cover a part of the thin film coil with the insulating layer in between, and

a third region of the photoresist layer corresponding to the third magnetic layer portion is simultaneously exposed by the second exposure step.

25. A method of manufacturing a thin film magnetic head according to claim 24, further including:

a development step of forming a first photoresist pattern by developing the first and second regions which have been exposed, all together; and

a step of integrally forming the first, second and third magnetic layer portion in one piece using the first photoresist pattern.

26. A method of manufacturing a thin film magnetic head according to claim 20 further including:

a development step of forming a second photoresist pattern by developing the first and second regions which have been exposed, all together; and

a step of integrally forming the first and second magnetic layer portion in one piece using the second photoresist pattern.

27. A method of manufacturing a thin film magnetic head according to claim 26, wherein the one of the two magnetic layers further includes a third

magnetic layer portion which is magnetically coupled to the second magnetic layer portion and extends to cover a part of the thin film coil with the insulating layer in between;

the method further comprising:

a third exposure step of exposing a third region corresponding to the third magnetic layer;

a development step of forming a third photoresist pattern by developing the third region exposed in the third exposure step; and

a step of forming the third magnetic layer portion using the third photoresist pattern.